

Series Brushless ESC INSTRUCTION

Thanks to purchase **Hifei**® G-series brushless ESC for R/C electric model airplanes and helicopters. G-series ESC are high quality controllers at affordable price, there include tiniest 3A to powerful 200A, there must one appropriate for your airplane's configuration. G-series ESC support to fully program and firmware upgradeable by soft on PC. Through upgrading firmware, your ESC will never be obsolete. Please read this instruction carefully before use. Wish you have a pleasant flight.

◆ Features of the Hifei® ESC

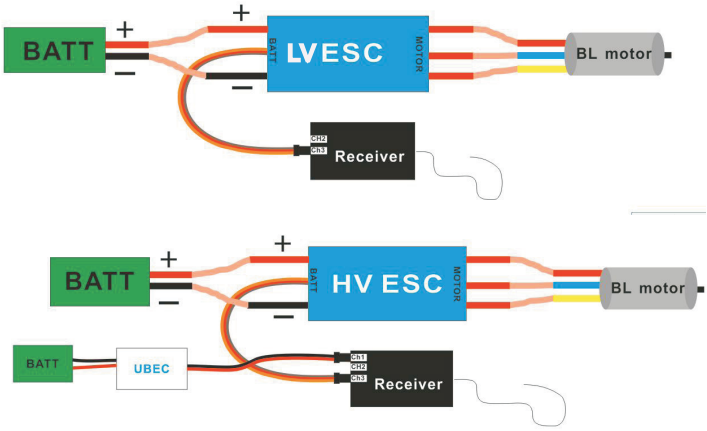
- Microprocessor controlled
- Extremely low resistance
- High rate adjustable switching (PWM:8KHz/12KHz/16KHz)
- Auto Lipo Cells Detecting
- Thermal Protection (100 centigrade)
- Safe “power on” arming program ensures motor will not accidentally turn on.
- Auto shut down when signal is lost or radio interference becomes severe for more than 3 seconds After radio connection has been reestablished, moving the throttle to the lowest position can restart the motor.
- Runs motor in forward or reverse by swapping any two motor wire connections.
- Apply to most of inrunner and outrunner brushless motors.
- Fully program by Hifei Program card, PC and TX.
- Firmware is upgradeable by PC.

◆ G-series Pro ESC specifications

| ESC | Voltage | Current / Max | BEC | Size(mm) | Weight (incl. wires) |
|-------------------------|-----------------------------|----------------|----------------------|-----------------|----------------------|
| Low Voltage ESC | | | | | |
| 20A-G-3S Pro | 2-3s Lipos 6-10s Ni-xx | 20amp/ 30amp | 5V, 2A (linear) | 48 x 27 x 10 | 23g |
| 40A-G-3S Pro | 2-3s Lipos 6-10s Ni-xx | 40amp/ 50amp | 5V, 2A (linear) | 51.5 x 27x 10.5 | 25g |
| 45A-G-6S Pro | 2-6s Lipos 6-20s Ni-xx | 45amp/ 65amp | 5V, 3.5A (switching) | 58x 26 x 17 | 40g |
| 60A-G-6S Pro | 2-6s Lipos 6-20s Ni-xx | 60amp/ 70amp | 5V, 3.5A (switching) | 71 x 26.5 x 15 | 50g |
| 80A-G-6S Pro | 2-6s Lipos 6-20s Ni-xx | 80amp/ 90amp | 5V, 3.5A (switching) | 71 x 26.5 x 15 | 52g |
| 120A-G-6S Pro | 2-6s Lipos 6-20s Ni-xx | 120amp/ 140amp | 5V, 3.5A (switching) | 90 x 52 x 16 | 118g |
| High Voltage ESC | | | | | |
| 65A-G-12S Pro | 4-12s Lipos 12-38s Ni-xx | 65amp/ 80amp | Couple-OPTO | 83 x 53 x 18 | 105g |
| 100A-G-12S Pro | 4-12s Lipos 12-38s Ni-xx | 100amp/ 120amp | Couple-OPTO | 83 x 53 x 18 | 109g |
| 150A-G-12S Pro | 4-12s Lipos 12-38s Ni-xx | 150amp/ 180amp | Couple-OPTO | 125 x 60 x 38 | 290g |
| 200A-G-12S Pro | 4-12s Lipos 12-38s Ni-xx | 200amp/ 220amp | Couple-OPTO | 125 x 60 x 38 | 294g |

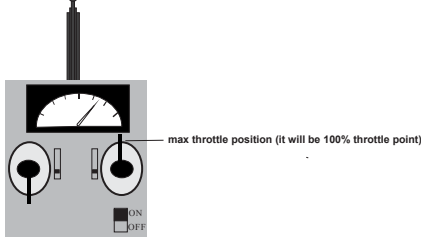
Note: 20A, 40A-G-3S ESC are disabled to start when input voltage is over 15V.
45A, 60A, 80A, 120A-G-6S ESC are disabled to start when input voltage is over 26V.
65A, 100A, 150A, 200A-G-12S ESC are disabled to start when input voltage is over 51V.

◆ Wiring ESC to motor, receiver, and battery



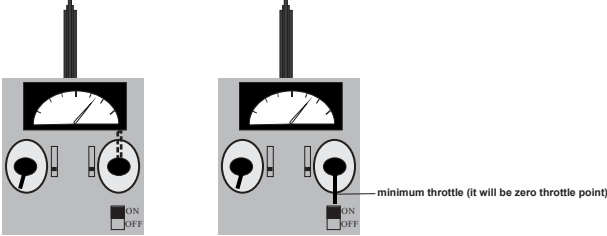
◆ Calibrate throttle travel of transmitter

- 1st:** Correctly connect ESC with brushless motor, plug the receiver lead of ESC into the throttle channel of receiver (usually CH3);
- 2nd:** Push the joystick of transmitter to max throttle position, power on the transmitter.



- 3rd:** Connect ESC to battery. 3 beeps in tune 🎵🎵🎵 emitted from the motor

- 4th:** After the following 2 beeps 🎵🎵, immediately pull joystick to minimum throttle .



- 5th:** 2 beeps 🎵🎵 emitting, calibrating is finished.

Motor is needed to install for acoustic guide. Meanwhile, please keep the propeller away from human beings or any objects.

◆ Programmable parameters

1 Low Voltage Cut-off (LVC)

Low Cut-off Voltage can protect the main battery from discharged too low, and provide the normal operating voltage to receiver and servos.

- form 1 about LVC options for 20A, 40A-G-3S ESC

| | |
|-----------------------|---|
| Option 1:Auto Lipo | Auto Lipo Cells Detecting |
| Option2:5.0V(default) | 6-8 cell NiCad or NiMH packs, or 2 cell Lithium packs |
| Option 3:6.0V | 8 cell NiCad or NiMH packs, or 2 cell Lithium packs |
| Option 4:7.2V | 9 cell NiCad or NiMH packs |
| Option 5:8.4V | 10 cell NiCad or NiMH packs, or 3 cell Lithium packs |
| Option 6:9.0V | 12 cell NiCad/ NiMH packs, or 3 cell Lithium packs |
| Option 7:12.0V | 4 cell Lithium packs |

- form 2 about LVC options for 45A, 60A, 80A, 120A-G-6S ESC

| | |
|------------------------|---|
| Option 1:Auto Lipo | Auto Lipo Cells Detecting |
| Option2:6.0V(default) | 6-8 cell NiCad or NiMH packs, or 2 cell Lithium packs |
| Option 3:7.2V | 8 cell NiCad or NiMH packs, or 2 cell Lithium packs |
| Option 4:8.4V | 9 cell NiCad or NiMH packs |
| Option 5:9.0V | 10 cell NiCad or NiMH packs, or 3 cell Lithium packs |
| Option 6:12.0V | 4 Lipo cells |
| Option 7:15.0V | 5 Lipo cells |
| Option 8:18.0v | 6 Lipo cells |

- form 3 about LVC options for 65A, 100A, 150A, 200A-G-12S ESC

| | |
|------------------------|---------------------------|
| Option 1:Auto Lipo | Auto Lipo Cells Detecting |
| Option2:12.0v(default) | 4 lipo cells |
| Option 3:15.0v | 5 lipo cells |
| Option 4:18.0v | 6 lipo cells |
| Option 5:21.0v | 7 lipo cells |
| Option 6:24.0v | 8 lipo cells |
| Option 7:27.0V | 9 Lipo cells |
| Option 8:30.0V | 10 Lipo cells |
| Option 9:33.0v | 11 Lipo cells |
| Option10:36.0v | 12 lipo cells |

2 Current Limiting

| | |
|----------------------------|--|
| Option 1: Very Sensitivity | Low over-current threshold, will rapidly shut-down. |
| Option 2:Standard(default) | Moderate over-current threshold, will shut down after a slight delay. Recommended for inrunner motors. |
| Option 3:Insensitivity | High over-current threshold, will shut down after a slight delay. Recommended for outrunner motors. Only experienced modelers should use this programming feature |
| Option 4: disabled | Current limiting detection disabled. Only experienced modelers should use this programming feature. |

NOTE: Default setting is recommended. If you change the setting, damage to the controller as a result of over current will be not covered by the manufacturer's warranty.

3 Brake Type

| | |
|-----------------------------------|--|
| Option 1:Brake disabled (default) | Brake disabled is mainly used for helicopters. |
| Option 2:Soft brake | Soft brake provides 50% of full braking power. General aircraft use, with fixed or folding prop |
| Option 3:Hard brake | Hard brake is 70% braking power. Direct drive applications where more braking power is required. Hard brake should only be used below 12V. |

4 Timing Advance

| | |
|--|---|
| Option 1: Low advance timing 0°~ 15 °(default) | Recommended for more lower pole count motors. Gives more power and slightly less efficient. |
| Option 2: middle advance timing 5 °~ 20 ° | Recommended for most motors .Gives a good balance of power and efficiency. |
| Option 3: High advance timing 15° ~ 30 ° | Recommended for most of higher pole count motors |
| Option4:Auto | Recommended for most of all brushless motors. |

5 Cutoff Type

| | |
|---------------------------------|--|
| Option 1 :Hard cutoff (default) | When battery voltage reaches cut-off voltage the motor will shutdown immediately. Motor can be restarted by closing the throttle to the lowest position and then move the throttle as normal |
| Option 2: Soft cutoff | When battery voltage reaches cut-off voltage, the ESC will slowly reduce motor power to zero , you will notice a decrease in power and it is time to land, the throttle maintains its full linear. |

NOTE: Soft cutoff is always automatically activated in Governor Mode.

6 Soft Start

| | |
|-------------------------------|--|
| Option 1: Very soft start | Recommended for helicopters |
| Option 2:Soft start (default) | Recommended for most of the fixed or folding prop airplanes, and some helicopters. |
| Option 3: Fast start | Recommended for fastest startup. |

7 Governor Mode

| | |
|---|---|
| Option 1: Auto calibrating throttle (default) | Recommended for general aircraft |
| Option 2: Low RPM Range | Recommended for collective pitch helicopters. Used for low pole count motors (Hacker, etc.) and low RPMs on higher pole count motors. |
| Option 3: High RPM Range | Recommended for collective pitch helicopters. Used for higher pole count motors and higher RPMs. |

NOTE: The Governor mode acts as an RPM control. Throttle stick position determines the RPM that the motor runs and the controller will attempt to hold that RPM regardless of load changes. In Governor Mode, the brake is always disabled and soft cutoff is automatically active.

8 PWM Switching Rate

| | |
|---------------------------|--|
| Option 1: 8 KHz (default) | Recommended for most brushless motors |
| Option 2: 12 KHz | Recommended for low inductance motors |
| Option 3: 16 KHz | Recommended for very low inductance motors |

Note: we strongly recommend only the experienced modeler could change this setting.

◆ Program by soft on PC

• Install software

Please download setup software 'HiFei Vx.0' from www.hifei.com.

The setup soft is checked to be no virus. Please double click it to start installing.

Please proceed the installing according to the handling tips in pop-up windows.

When installing is finished, a shortcut icon of the software is auto saved.



• Link ESC to PC

When link ESC to PC, a Hifei USB Linker (sold separately) is needed.

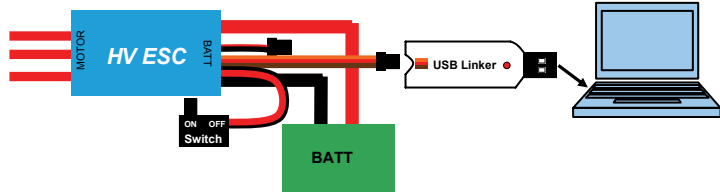
A. Link LV ESC to PC

- 1st step: plug the receiver lead of ESC to USB Linker in right polarity,
- 2nd step: plug USB Linker into one of USB Ports of ESC.
- 3rd step: the red LED of USB Linker lights, the green LED on ESC lights.



B. Link HV ESC to PC

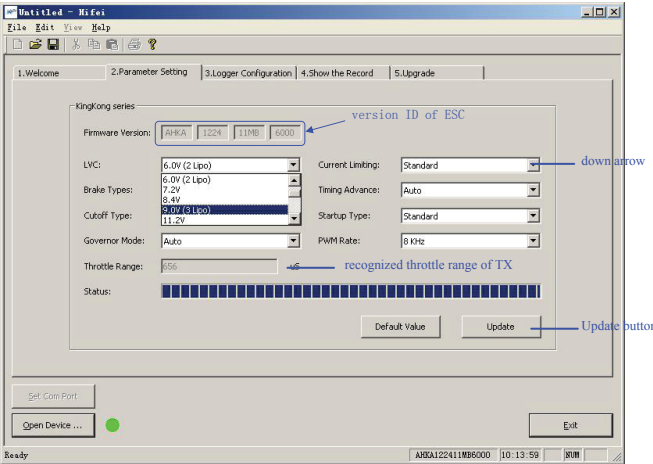
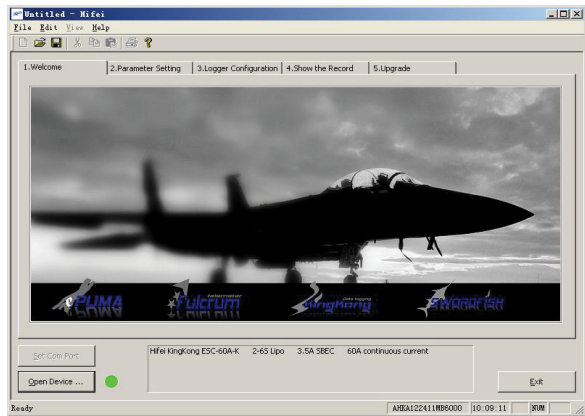
- 1st step: Switch off if there is a switch on ESC.
- 2nd step: plug the receiver lead of ESC to USB Linker in right polarity,
- 3rd step: plug USB Linker into one of USB Ports of ESC.
- 4th step: connect ESC to battery. Switch on.
- 5th step: the red LED of USB Linker lights, the green LED on ESC lights.



• Open software to change parameters

Double click the shortcut icon of software.

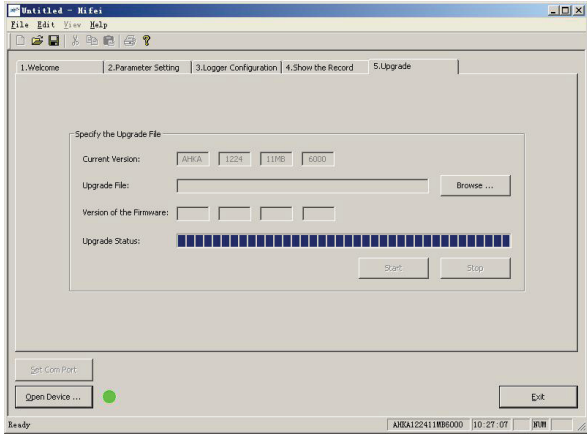
Click 'Open Device'. If ESC is successfully linked to PC, it will auto jumped to the programming tab, as below pictures:



- Click down arrow to select the parameter options you would like to set.
- Click '**Update**' to save modifications.
- Click '**Exit**' to finish programming and ready to fly now.

◆ Upgrade ESC's firmware

- Click tab ‘Upgrade’

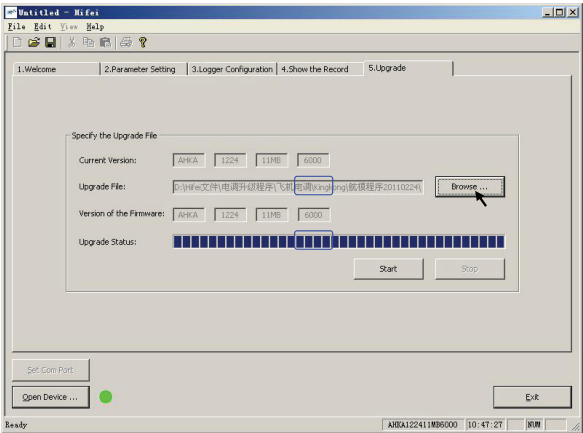


- Click ‘Browse’ to select the new firmware which the ESC will be upgraded into.

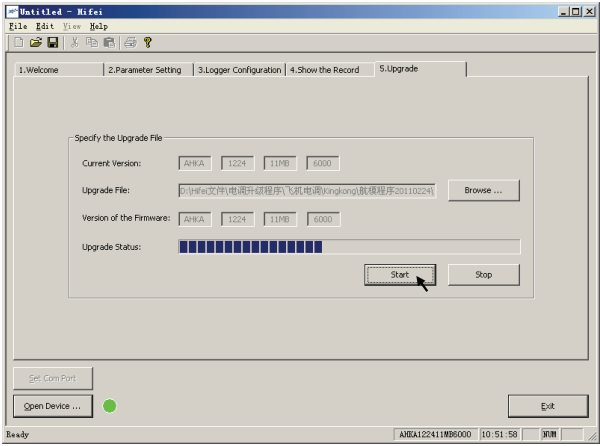
(you can download the firmware from www.hifei.com)

Note: The firmware must be the right one for the specific ESC which will be upgraded.

If a ESC is upgraded into a wrong firmware, it would be possibly be damaged.



- Click ‘start’ to begin upgrading. Please wait for a while, it will be finished within 20 seconds.



- ‘Download successful’ , upgrading finished.

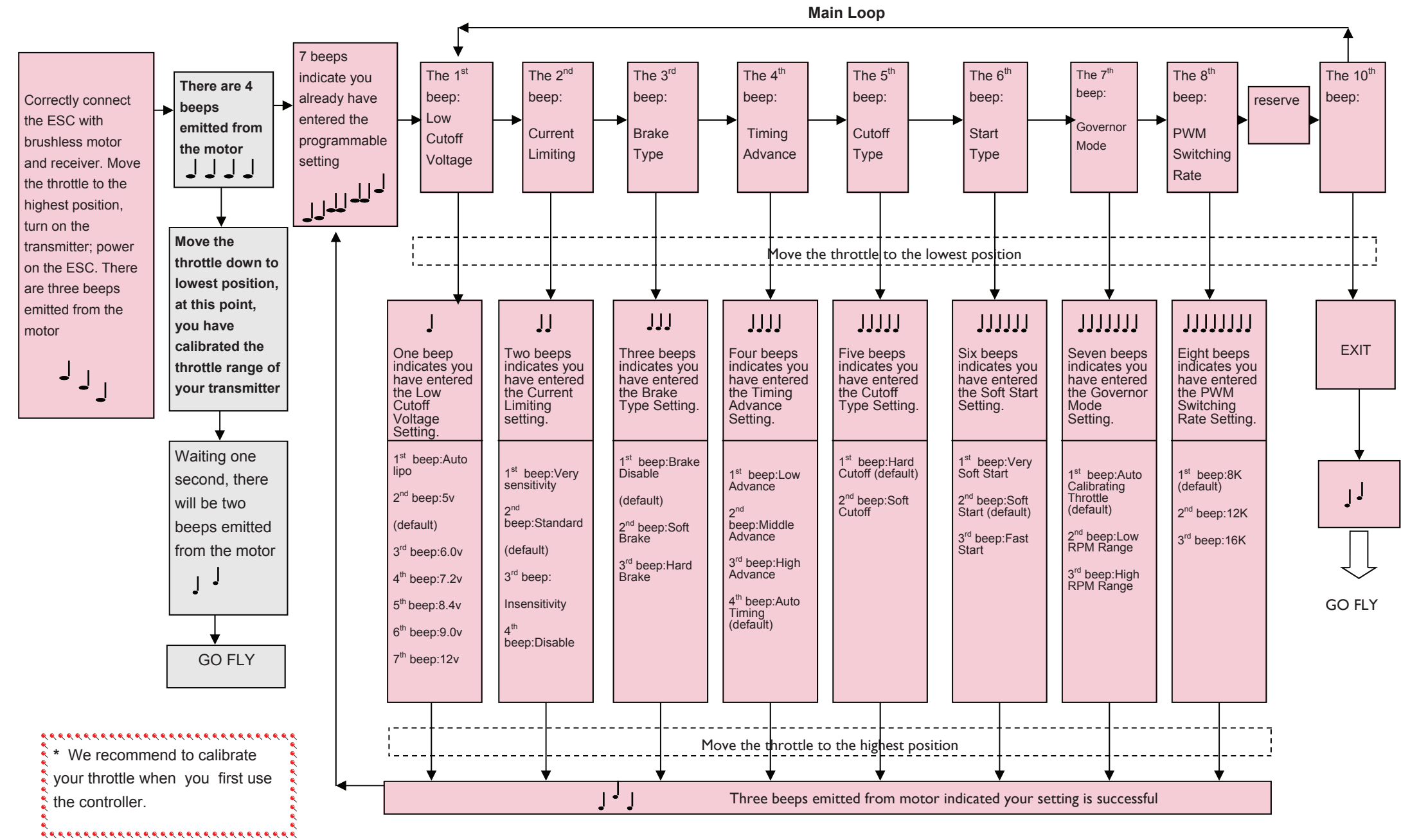


Using Notes

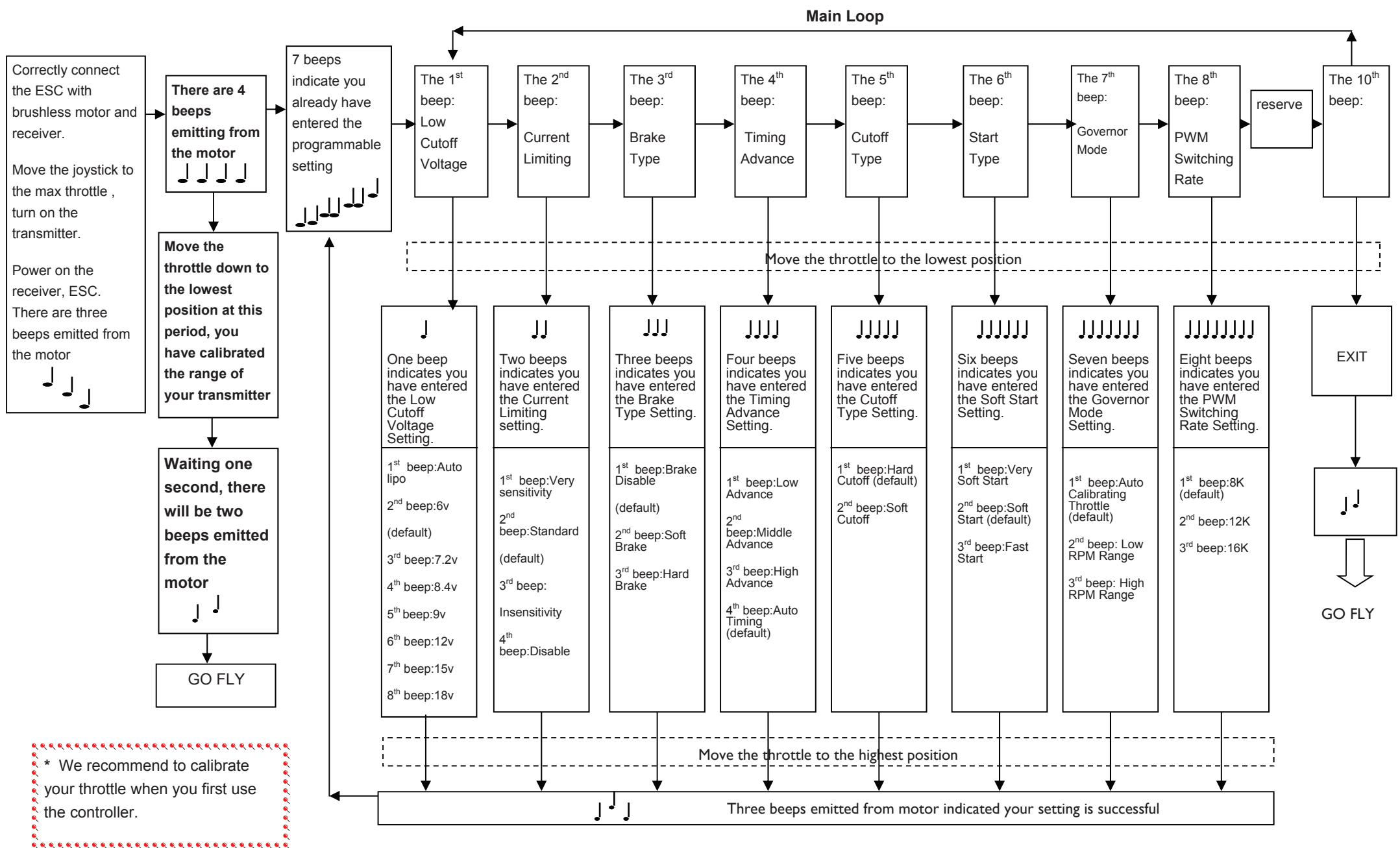
- It's strongly **recommended** to calibrate the throttle range of your transmitter when you first use the ESC or when use a new/different transmitter or receiver.
- When connecting the ESC, ensure that the polarity of battery is correct. Incorrect polarity may cause permanent damage to the ESC and such damage is not covered by the WARRANTY.
- When you use the ESC, turn on the transmitter BEFORE powering on the receiver.
- When you finish the flying, power off the receiver BEFORE turning off the transmitter.
- It is very **IMPORTANT** to make sure the ESC is mounted in a good air flowing place for heat sinking.
- The limiting current is set to the standard mode in factory. It is suitable for use in most configurations. Only experienced technicians can adjust this programming.
- In Governor Mode, the brake is always disabled and the soft cutoff is always active.
- Changing the PWM may cause the motor to heat ahead of time.
- Do not play on or near water. Never allow water, moisture or any foreign object onto the PC board of the ESC.
- Damage to the controller as a result of excessively high current is not covered by the manufacturer's WARRANTY.
- Never disconnect the battery pack while the motor is running, as this could cause damage to the speed controller and/or motor.
- Never allow the separate heat sinks to touch each other or any exposed conductive surface. This may cause short circuit, damage the ESC, and VOID the WARRANTY.
- Connectors with low conductivity may cause erratic motor rotations or other unexpected movements
- If you do not use the BEC function of the ESC and are using a separate receiver battery or UBEC instead to power receiver and servos, please disconnect the red wire from the ESC's receiver lead.
- The controller will automatically power off the motor if the battery voltage drops below the programmed cut-off voltage. Try using a smaller prop on the motor, or using batteries with a higher rating. It is especially important for the user of Li-poly cells.
- Allowing water, lubricants, moisture or other foreign objects inside the ESC will VOID the WARRANTY. Exposure to CA glue or its fumes can cause damage and malfunction; this will also VOID the WARRANTY.

◆ Fully program by TX

Operational Flowchart for Programming 20A, 40A-G-3S ESC by Throttle



Operational Flowchart for Programming 45A, 60A, 80A and 120A-G-6S ESC by Throttle



Operational Flowchart for Programming HV ESC by Throttle

